

Robert K Goldberg

## **PUBLICATIONS**

### **Journal**

#### **2005**

1. Goldberg, R.K.; Roberts, G.D.; and Gilat, A.: "Implementation of an Associative Flow Rule Including Hydrostatic Stress Effects Into the High Strain Rate Deformation Analysis of Polymer Matrix Composites.", Journal of Aerospace Engineering, Vol. 18, pp. 18-27, 2005.
2. Zhu, L.; Kim, H.S.; Chattopadhyay, A.; and Goldberg, R.K.: "Improved Transverse Shear Calculations for Rate Dependent Analyses of Polymer Matrix Composites", accepted in AIAA Journal, tentative publication February, 2005.

#### **2004**

3. Goldberg, R.K.; Roberts, G.D.; and Gilat, A.: "Analytical Studies of the High Strain Rate Tensile Response of a Polymer Matrix Composite" Journal of Advanced Materials, Vol. 36, pp. 14-24, 2004.

#### **2003**

4. Goldberg, R.K.; Roberts, G.D.; and Gilat, A.: "Incorporation of mean stress effects into the micromechanical analysis of the high strain rate response of polymer matrix composites." Composites Part B: Engineering, Vol. 34, pp. 151-165, 2003.
5. Goldberg, R.K.; and Gilat, A.: "Experimental and Computational Characterization of the High Strain Rate Tensile Response of Polymer Matrix Composites." Composite Materials, Testing and Design Fourteenth Volume, ASTM STP 1436, C.E. Bakis, Editor, American Society for Testing and Materials, West Conshocken, PA, pp. 207-223, 2003.

#### **2002**

6. Goldberg, R.K.; and Stouffer, D.C.: "Strain Rate Dependent Analysis of a Polymer Matrix Composite Utilizing a Micromechanics Approach." Journal of Composite Materials, Vol. 36, pp. 773-793, 2002.
7. Gilat, A.; Goldberg, R.K.; and Roberts, G.D.: "Experimental Study of Strain Rate Behavior of Carbon/Epoxy Composite." Composites Science and Technology, Vol. 62, pp. 1469-1476, 2002.

#### **1997**

8. Mital, S.K.; Murthy, P.L.N.; and Goldberg, R.K.: "Micromechanics for Particulate Reinforced Composites." Mechanics of Composite Materials and Structures, Vol. 4, pp. 251-266, 1997.

#### **1995**

9. Goldberg, R.K.; and Hopkins, D.A.: "Application of the Boundary Element Method to the Micromechanical Analysis of Composite Materials." Computers and Structures, Vol. 56, pp. 721-731, 1995.
10. Goldberg, R.K.; and Hopkins, D.A.: "Thermal Analysis of a Functionally Graded Material Subject to a Thermal Gradient Using the Boundary Element Method." Composites Engineering, Vol. 5, pp. 793-806, 1995.

## NASA Technical Reports

### 2004

1. Goldberg, R.K.; and Carney, K.S.: "Modeling the Nonlinear, Strain Rate Dependent Deformation of Woven Ceramic Matrix Composites With Hydrostatic Stress Effects Included." NASA TM-2004-213125, 2004.
2. Zhu, L.; Kim, H.S.; Chattopadhyay, A.; and Goldberg, R.K.: "Implementation of Improved Transverse Shear Calculations and Higher Order Laminate Theory into Strain Rate Dependent Analyses of Polymer Matrix Composites.", NASA TM-2004-213420, 2004.

### 2003

3. Goldberg, R.K.; Roberts, G.D.; and Gilat, A.: "Implementation of an Associative Flow Rule Including Hydrostatic Stress Effects Into the High Strain Rate Deformation Analysis of Polymer Matrix Composites." NASA TM-2003-212382, 2003.
4. Zheng, X.; Goldberg, R.K.; Binienda, W.K.; and Roberts, G.D.: "LS-DYNA Implementation of Polymer Matrix Composite Model Under High Strain Rate Impact." NASA TM-2003-212583, 2003.

### 2002

5. Goldberg, R.K.: "Computational Simulation of the High Strain Rate Tensile Response of Polymer Matrix Composites." NASA TM-2002-211489, 2002.
6. Goldberg, R.K.; Roberts, G.D.; and Gilat, A.: "Incorporation of Mean Stress Effects Into the Micromechanical Analysis of the High Strain Rate Response of Polymer Matrix Composites." NASA TM-2002-211702, 2002.

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7. Goldberg, R.K.: "Implementation of Fiber Substructuring Into Strain Rate Dependent Micromechanics Analysis of Polymer Matrix Composites." NASA TM-2001-210822, 2001.

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8. Goldberg, R.K.; and Arnold, S.M.: "A Study of Influencing Factors on the Tensile Response of a Titanium Matrix Composite With Weak Interfacial Bonding." NASA TM-2000-209758, 2000.
9. Goldberg, R.K.: "Implementation of Laminate Theory Into Strain Rate Dependent Micromechanics Analysis of Polymer Matrix Composites." NASA TM-2000-210351, 2000.

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10. Goldberg, R.K.; and Stouffer, D.C.: "Rate Dependent Deformation and Strength Analysis of Polymer Matrix Composites." NASA TM-1999-209060, 1999.
11. Goldberg, R.K.; Comiskey, M.D.; and Bednarcyk, B.A.: "Micromechanics Analysis Code Post-Processing (MACPOST) User Guide Version 1.0." NASA TM-1999-209062, 1999.
12. Goldberg, R.K.; and Stouffer, D.C.: "Strain Rate Dependent Modeling of Polymer Matrix Composites." NASA TM-1999-209433, 1999.
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14. Goldberg, R.K.; and Stouffer, D.C.: "High Strain Rate Deformation Modeling of a Polymer Matrix Composite Part I-Matrix Constitutive Equations." NASA TM-1998-206969, 1998.
15. Goldberg, R.K.; and Stouffer, D.C.: "High Strain Rate Deformation Modeling of a Polymer Matrix Composite Part II-Composite Micromechanical Model." NASA TM-1998-208664, 1998.

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16. Mital, S.K.; Murthy, P.L.N.; and Goldberg, R.K.: "Micromechanics for Particulate Reinforced Composites." NASA TM-107276, 1996.
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#### **1994**

18. Goldberg, R.K.; and Hopkins, D.A.: "Thermal analysis of a functionally graded material subject to a thermal gradient using the boundary element method." NASA TM-106801, 1994.

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19. Goldberg, R.K.; and Hopkins, D.A.: "Composite micromechanical modeling using the boundary element method." NASA TM-106127, 1993.
20. Goldberg, R.K.; and Hopkins, D.A.: "Micromechanical modeling of laminated composites with interfaces and woven composites using the boundary element method." NASA TM-106280, 1993.

## **1992**

21. Goldberg, R.K.: "COMGEN-BEM: Boundary element model generation for composite materials micromechanical analysis." NASA TM-105548, 1992.

## **Conference Proceedings and Presentations**

### **2005**

1. Gilat, A.; Goldberg, R.K.; and Roberts, G.D.: "The Effects of Strain Rate and Temperature on the Response of Epoxy in Shear Loading", International Symposium on Plasticity 2005, Kauai, HI, Jan. 3-8, 2005.

### **2004**

2. Zheng, X.; Goldberg, R.K.; Binienda, W.K.; and Roberts, G.D.: "Development and Implementation of Rate Dependent Composite Material Model for Shell Element Application in LS-DYNA.", Earth & Space 2004, 9<sup>th</sup> ASCE Aerospace Division International Conference on Engineering, Construction and Operations in Challenging Environments, Houston, Texas, March 7-10, 2004.
3. Zhu, L.; Kim, H.S.; Chattopadhyay, A.; and Goldberg, R.K.: "Implementation of Higher Order Laminate Theory into Strain Rate Dependent Micromechanics Analysis of Polymer Matrix Composites.", Paper AIAA 2004-1638, 45th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics & Materials Conference, Palm Springs, CA, April 19-22, 2004.
4. Goldberg, R.K.; and Carney, K.S.: "Modeling the Nonlinear, Strain Rate Dependent Deformation of Shuttle Leading Edge Materials with Hydrostatic Stress Effects Included", Proceedings of 8<sup>th</sup> International LS-DYNA Users Conference, Dearborn, MI, May 2-4, 2004.

### **2003**

5. Goldberg, R.K.; Roberts, G.D.; and Gilat, A.: "Analytical Modeling of the High Strain Rate Deformation of Polymer Matrix Composites." 44<sup>th</sup> AIAA/ASME/ASCE/AHS Structures, Structural Dynamics, and Materials Conference, Paper AIAA-2003-1754, Norfolk, VA, April 7-10, 2003.
6. Gilat, A.; Goldberg, R.K.; and Roberts, G.D.: "Strain Rate Sensitivity of Epoxy in Tensile and Shear Loading." 2003 ASME Mechanics and Materials Conference, Scottsdale, AZ, June 17-20, 2003.

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8. Goldberg, R.K.; Roberts, G.D.; and Gilat, A.: "Incorporation of Mean Stress Effects into the Micromechanical Analysis of the High Strain Rate Response of Polymer Matrix Composites." Proceedings of ICCE/9, Ninth International Conference on Composites Engineering, San Diego, CA, July 1-6, 2002, D. Hui, editor, pp. 245-246, 2002.

## 2001

9. Gilat, A.; Goldberg, R.K.; and Roberts, G.D.: "Experimental Study of Strain Rate Sensitivity of Carbon Fiber/Epoxy Composite." ICCM 13 Conference, Beijing, China, June, 2001.
10. Goldberg, R.K.: "Implementation of Fiber Substructuring Into Strain Rate Dependent Micromechanics Analysis of Polymer Matrix Composites." Proceedings of the American Society for Composites Sixteenth Technical Conference, Blacksburg, VA, Sept. 10-12, 2001, M.W. Hyer and A.C. Loos, editors, CRC Press, 2001.
11. Goldberg, R.K.; Roberts, G.D.; and Gilat, A.: "Constitutive Modeling of the Strain Rate Tensile Response of Polymer Matrix Composites." TMS Fall Meeting 2001, Indianapolis, IN, Nov. 4-8, 2001.
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14. Goldberg, R.K.; Roberts, G.D.; Gilat, A.; and Stouffer, D.C.: "Experimental and Analytical Studies of the High Strain Rate Tensile Response of a Polymer Matrix Composite Utilizing a Micromechanics Approach." ASME International Mechanical Engineering Congress and Exposition, Orlando, FL, Nov. 11-16, 2000.

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15. Goldberg, R.K.; and Stouffer, D.C.: "Strain Rate Dependent Deformation and Strength Analysis of Polymer Matrix Composites." Proceedings of the American Society for Composites Fourteenth Technical Conference, Dayton, OH, Sept. 27-29, 1999, J.M. Whitney, editor, Technomic Publishing Company, pp. 551-560, 1999.

## **1998**

16. Goldberg, R.K.; and Stouffer, D.C.: "High Strain Rate Characterization of a Polymer Matrix Composite Utilizing a Micromechanics Approach." Modeling and Simulation Based Engineering, Proceedings of the International Conference on Computational Engineering, Atlanta, GA, Oct. 6-9, 1998, S.N. Atluri and P.E. O'Donoghue, editors, pp. 1090-1095, 1998.

## **1997**

17. Wilt, T.E.; Arnold, S.M.; and Goldberg, R.: "Micromechanics Analysis Code, MAC: Features and Applications." Proceedings of the Annual HITEMP Review, Westlake, OH, Apr. 29-30, 1997, NASA CP-10192, 1997.

## **1995**

18. Goldberg, R.K.; and Comiskey, M.D.: "COMGEN-BEM: Boundary Element Model Generation for Composite Materials Micromechanical Analysis." MSC 1995 World Users' Conference Proceedings, Universal City, CA, May 8-12, 1995, The MacNeal-Schwendler Corporation, 1995.
19. Goldberg, R.K.; and Hopkins, D.A.: "Further Applications of the Boundary Element Method in the Micromechanical Modeling of Woven Composites." Proceedings of the Annual HITEMP Review, Westlake, OH, Oct. 23-23, 1995, NASA CP-10178, 1995.

## **1994**

20. Goldberg, R.K.; and Hopkins, D.A.: "Micromechanical Analysis of Functionally Graded Materials Using the Boundary Element Method." Proceedings of ICCE/1, First International Conference on Composites Engineering, New Orleans, LA, Aug. 28-31, 1994, D. Hui, editor, pp. 167-168, 1994.
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23. Goldberg, R.K.; and Hopkins, D.A.: "Micromechanical Modeling of Laminated Composites with Interfaces and Woven Composites Using the Boundary Element Method." Proceedings of the American Society for Composites Eighth Technical Conference, Cleveland, OH, Oct. 19-21, 1993, G.M. Newaz, editor, Technomic Publishing Company, pp. 1035-1044, 1993.

24. Goldberg, R.K.; and Hopkins, D.A.: "Utilization of Boundary Element Method in Modeling Interface Effects in SiC/RBSN Composites." Proceedings of the 6<sup>th</sup> Annual HITEMP Review, Westlake, OH, Oct. 25-27, 1993, NASA CP-19117, 1993.

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25. Goldberg, R.K.; and Hopkins, D.A.: "Composite Micromechanical Modeling Using the Boundary Element Method." Proceedings of the American Society for Composites Seventh Technical Conference, University Park, PA, Oct. 13-15, 1992, H.T. Hahn, editor, Technomic Publishing Company, pp. 349-358, 1992.
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